

ABSTRACT

[0048] A flame torch can be used to clean the surface of a contact-sensitive object, such as a glass optic, extremely thin workpiece, or semiconductor wafer by providing a reactive precursor gas to the feed gases of the torch. Reactive atom plasma processing can be used to clean the surface of a contaminant that chemically combines with the atomic radicals of the precursor without affecting the surface. The torch can also be used to modify the surface after cleaning, without transferring the object or engaging in any intermediate processing, by supplying a second reactive precursor that reacts with the surface itself. The flame torch can be used to shape, polish, etch, planarize, deposit, chemically modify and/or redistribute material on the surface of the object.

This description is not intended to be a complete description of, or limit the scope of, the invention. Other features, aspects, and objects of the invention can be obtained from a review of the specification, the figures, and the claims.